CWP-854
Wireless-G
PCI Adapter

User's Manual

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Chapter 1. Introduction

1.1. About CWP-854

The Wireless-G PCI Adapter can be installed in most desktops and provides true flexibility by allowing the computer to be positioned almost anywhere in the building without the cost and hassle of running network cables. Using the wireless PCI adapter, you don't have to worry about drilling holes in your walls and climbing through the attic or cellar to get connected to the network. Once installed and connected, you can keep in touch with friends and work through e-mail, instant messaging and chat rooms as well as sharing files and other network resources such as printers and network storage with other computers.
The Wireless-G PCI Adapter connects to 802.11g networks at an incredible speed of 54Mbps and for added versatility; it also interoperates with all Wireless-B (802.11b) products found at homes, businesses, and public wireless hotspots around the country.

1.2. Main Features

The following lists the main features of the Wireless-G PCI Adapter.

- 5 Times Faster and seamless operation with existing Wireless-B networks.
- Improves the coverage up to 300% greater than standard 802.11g.
- 64/128-bit WEP and WPA/WPA2 (Wi-Fi Protected Access) Encryption Provides Maximum Wireless Security.
- Ease of Installation and Use.
- Compatible with Windows 98SE/ME/2000/2003/XP/Vista.

1.3. Getting to Know CWP-854

This section describes the panel of the Wireless-G PCI Adapter.
The LEDs are located on the bracket of the Wireless-G PCI Adapter.

Figure 1-1 The Panel

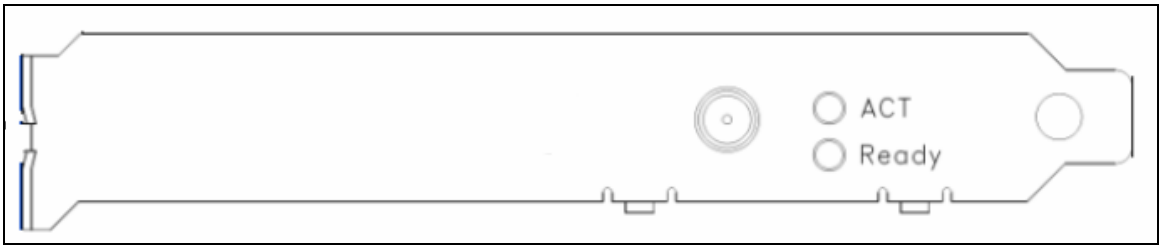


Table 1-1 The Panel

LABEL	COLOR	STATUS	DESCRIPTION
Ready	Green	On	When the card links to a wireless device.
		Off	The card does not link any wireless device.
ACT	Green	Blinking	When the card transmits/receives data.
		Off	No data is being transmitted or received

Chapter 2. Installing Driver, Configuration Utility and Hardware

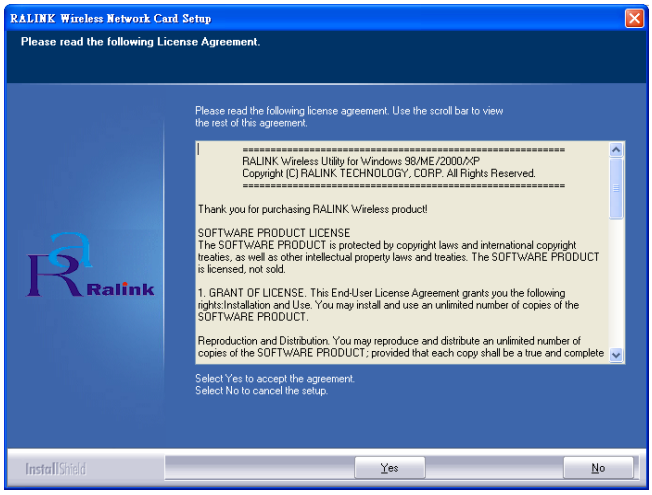
2.1. Driver Installation for Windows 98SE/ME/2000/2003/XP

Before installing your Wireless-G PCI Adapter, insert the Auto-Install CD into your CD-ROM drive. Unless you have disabled the auto-run feature of Windows, the AutoPlay Menu should appear automatically. If not, you can manually access the installation by clicking the **Start** button and choosing **Run**. In the drop-down box type D:\ AUTORUN.EXE (where D: is the drive letter for your CD-ROM drive).

Alternately, double-click **My Computer** and double-click on the **CD drive icon**.

- Click on **CWP-854** to install driver/utility for your Wireless-G PCI Adapter.
  Figure 2-1 AutoPlay Menu

- After reading through the License Agreement, please click **Yes** to continue.
  Figure 2-2 Setup: License Agreement


RALINK Wireless Network Card Setup
Please read the following License Agreement.
Please read the following license agreement. Use the scroll bar to view the rest of this agreement.
RALINK Wireless Utility for Windows 98/ME/2000/XP
Copyright (C) RALINK TECHNOLOGY, CORP. All Rights Reserved.
Thank you for purchasing RALINK Wireless product!
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The SOFTWARE PRODUCT is protected by copyright laws and international copyright treaties, as well as other intellectual property laws and treaties. The SOFTWARE PRODUCT is licensed, not sold.
1. GRANT OF LICENSE. This End-User License Agreement grants you the following rights:Installation and Use. You may install and use an unlimited number of copies of the SOFTWARE PRODUCT.
Reproduction and Distribution. You may reproduce and distribute an unlimited number of copies of the SOFTWARE PRODUCT; provided that each copy shall be a true and complete
Select Yes to accept the agreement.
Select No to cancel the setup.
Ralink
InstallShield
Yes
No

- Select the **Optimize for WiFi mode** or **Optimize for performance mode**, then click

Next > to continue.

Figure 2-3 Setup: Choose Configuration TxBurst or WiFi

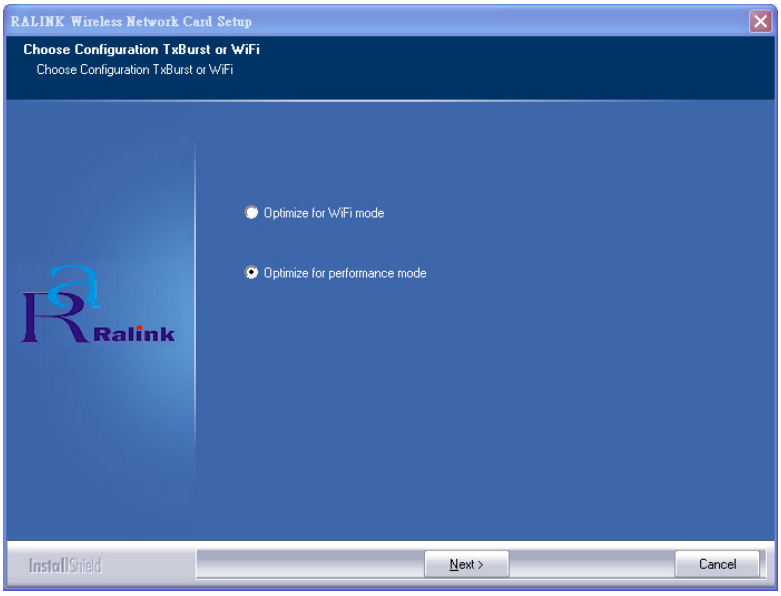
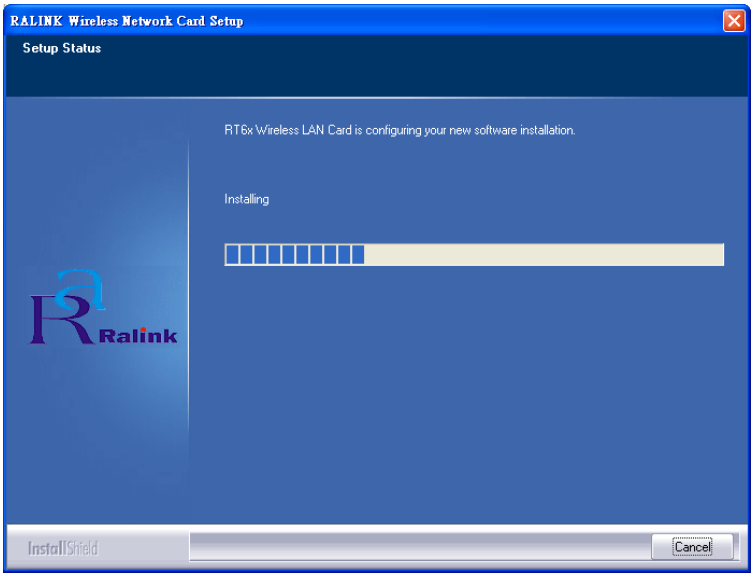


Table 2-1 Choose Configuration TxBurst or WiFi

OPTION	DESCRIPTION
Optimize for WiFi mode	The Tx BURST and TCP Window Size features will be disabled.
Optimize for performance mode	The Tx BURST and TCP Window Size features will be enabled.

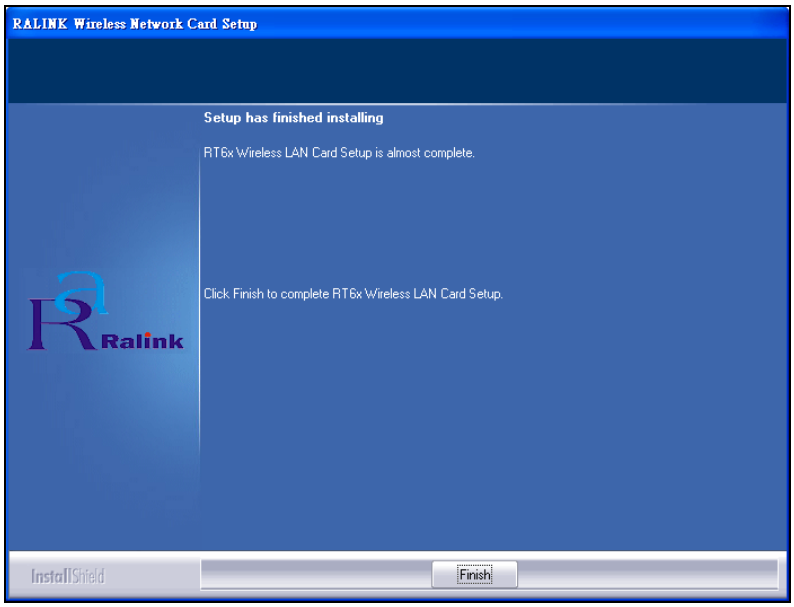
- The driver will be installed to your computer. The Setup Status screen will be displayed.

Figure 2-4 Setup: Setup Status



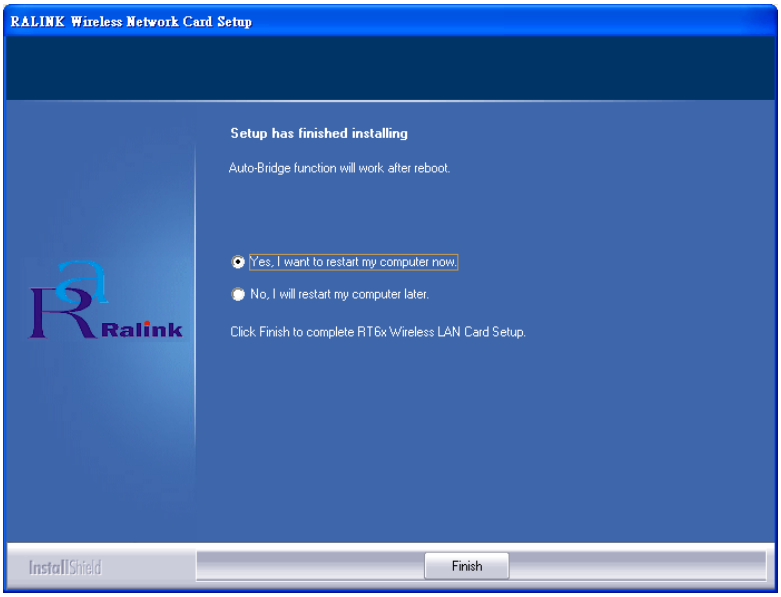
- In Windows XP and 2000, click **Finish** to complete the installation.

Figure 2-5 Setup: Click Finish to Complete (for WIN2000 / 2003 / XP)


RALINK Wireless Network Card Setup
Setup has finished installing
RT6x Wireless LAN Card Setup is almost complete.
Click Finish to complete RT6x Wireless LAN Card Setup.
Ralink
InstallShield
Finish

- In Windows 98SE and ME, please select **Yes, I want to restart my computer now** and click **Finish** to complete the installation. The system will restart automatically.

Figure 2-6 Setup: Click Finish to Complete (for WIN98 / ME)

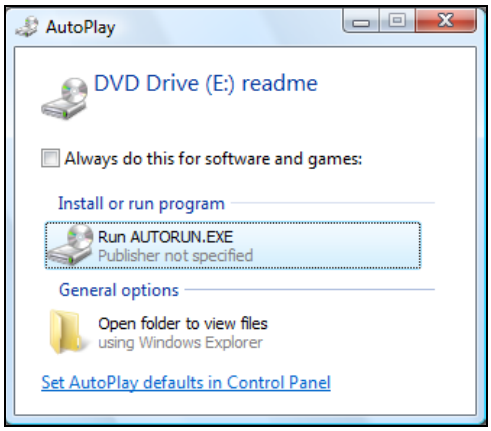

RALINK Wireless Network Card Setup
Setup has finished installing
Auto-Bridge function will work after reboot.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Click Finish to complete RT6x Wireless LAN Card Setup.
Ralink
InstallShield
Finish

2.2. Driver Installation for Windows Vista

Before installing your Wireless-G Cardbus Adapter, insert the Auto-Install CD into your CD-ROM drive.

- There will be a **Vista AutoPlay Confirm Window**. Click **Run AUTORUN.EXE** icon.

Figure 2-7 AutoPlay Confirm Window (Vista)

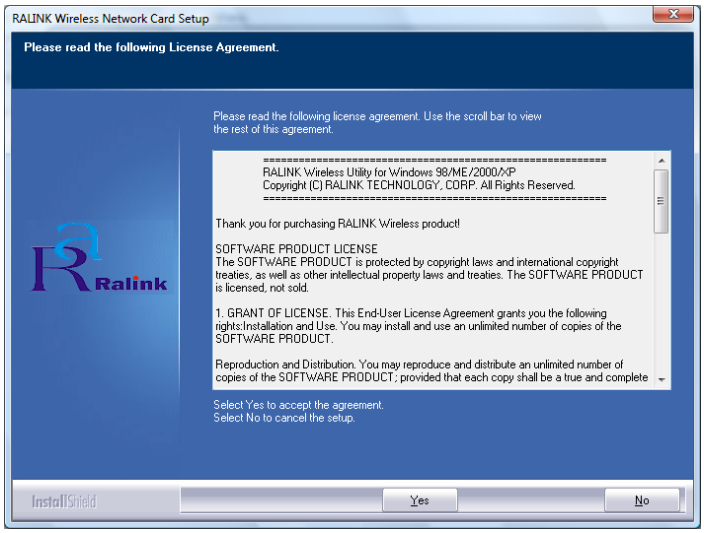


- Click on **CWP-854** to install driver/utility for your Wireless-G USB Dongle.

Figure 2-8 AutoPlay Menu (Vista)

- After reading through the License Agreement, please click **Yes** to continue.

Figure 2-9 Setup: License Agreement (Vista)


RALINK Wireless Network Card Setup
Please read the following License Agreement.
Please read the following license agreement. Use the scroll bar to view the rest of this agreement.
RALINK Wireless Utility for Windows 98/ME/2000/XP
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The SOFTWARE PRODUCT is protected by copyright laws and international copyright treaties, as well as other intellectual property laws and treaties. The SOFTWARE PRODUCT is licensed, not sold.
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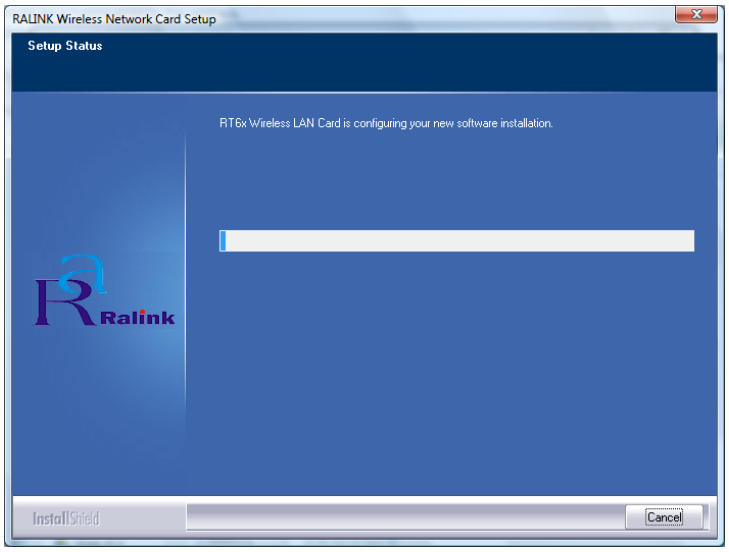
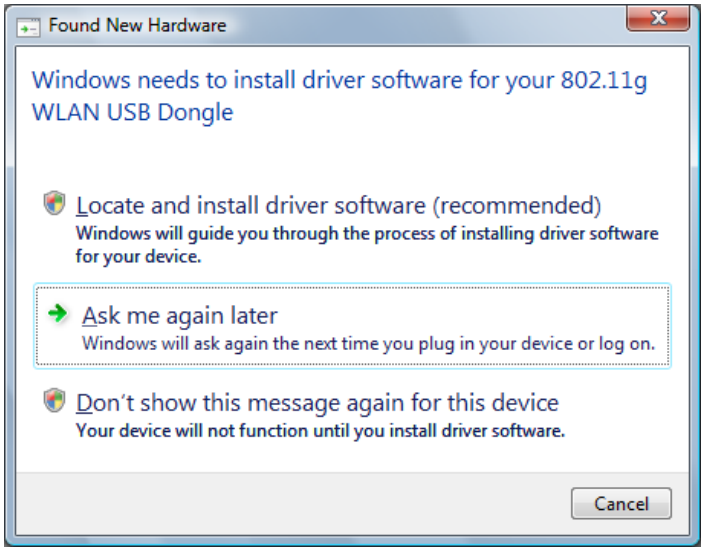
Reproduction and Distribution. You may reproduce and distribute an unlimited number of copies of the SOFTWARE PRODUCT; provided that each copy shall be a true and complete
Select Yes to accept the agreement.
Select No to cancel the setup.
Ralink
InstallShield
Yes
No

- The driver will be installed to your computer. The Setup Status screen will be displayed.
  Figure 2-10 Setup: Setup Status (Vista)



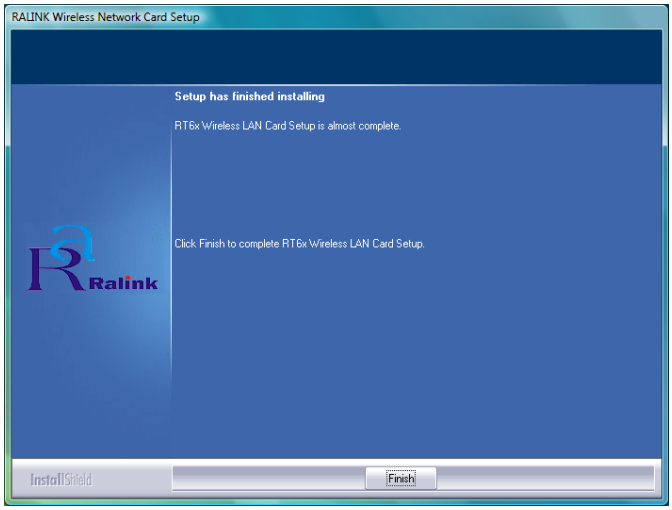
- There will be a **plug-in message** screen. Please insert the Wireless-G USB Dongle into the USB port at this moment.
  Figure 2-11 Setup: plug-in message (Vista)

- Click **Ask me again later** when the **Found New Hardware** window appears.
  Figure 2-12 Setup: Found New Hardware (Vista)


Found New Hardware
Windows needs to install driver software for your 802.11g WLAN USB Dongle
Locate and install driver software (recommended)
Windows will guide you through the process of installing driver software for your device.
Ask me again later
Windows will ask again the next time you plug in your device or log on.
Don't show this message again for this device
Your device will not function until you install driver software.
Cancel

- Click **Finish** to complete the installation.

Figure 2-13 Setup: Click Finish to Complete (Vista)


RALINK Wireless Network Card Setup
Setup has finished installing
RT6x Wireless LAN Card Setup is almost complete.
Click Finish to complete RT6x Wireless LAN Card Setup.
Ralink
InstallShield
Finish

2.3. Insert the Wireless-G PCI Adapter

To insert the Wireless-G PCI Adapter into a desktop computer, please follow the steps below:

- Turn off your computer.
- Open the case and locate an available PCI slot on the motherboard. Check with computer manufacturer for instructions.
- Slide the PCI Adapter into the PCI slot. Make sure that all its pins are touching the slot's contacts. You may have to apply a bit of pressure to slide the adapter all the way in. After the adapter is firmly in place, secure its fastening tab to your PC's chassis with

a mounting screw and close the case.
- Attach the external antenna to the adapter's antenna connector.
- Power on your desktop PC.

Microsoft Windows will automatically detect and complete the Wireless-G PCI Adapter installation.

Note: In Windows ME and 98SE, following the hardware installation Windows will ask to restart the computer, just click **Yes** to restart.

Chapter 3. Using the Configuration Utility for 98SE/ME/2000/2003/XP/Vista

3.1. Overview

The wireless Configuration Utility can be used to check link information, search for available wireless networks, or to create profiles that hold different configuration settings.

3.2. Access the Configuration Utility

The Configuration Utility icon will appear in your system tray. Double-click the icon.
Figure 3-1 Utility Icon

The utility contains six parts: **Profile**, **Link Status**, **Site Survey**, **Statistics**, **Advance**, and **About**. You should change all your configuration settings for the Wireless-G PCI Adapter by using this utility.

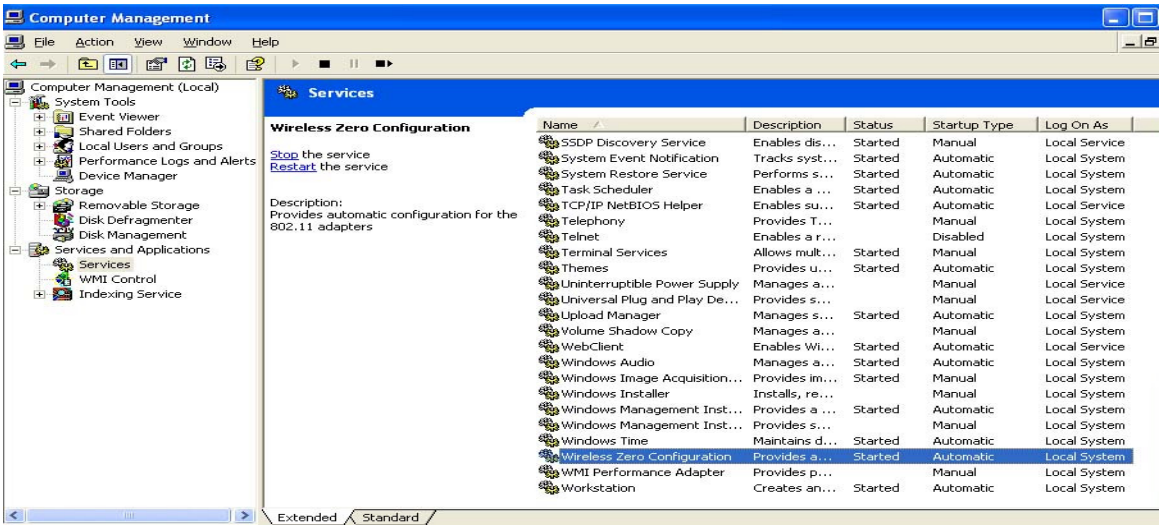
Note: In Windows XP, you should disable the Wireless Zero Configuration service following the steps below:

A. Right Click **My Computer** on the desktop and select **Manage**.

Figure 3-2 Wireless Zero Configuration: Select Manage

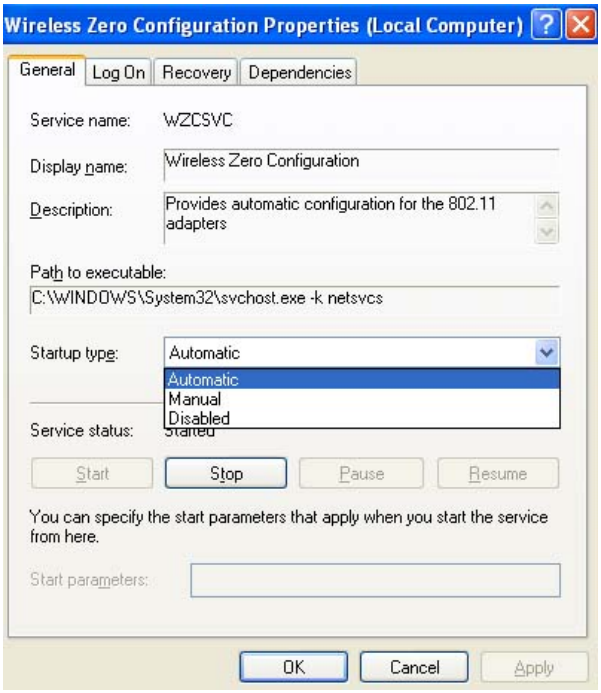
The Computer Management window comes up. Select **Services** from the Services and Applications menu. Scroll down to locate **Wireless Zero Configuration** service.

Figure 3-3 Wireless Zero Configuration: Select Wireless Zero Configuration



B. Double Click on **Wireless Zero Configuration** to go into its properties. For Startup type, choose **Disable** to disable the Wireless Zero Configuration then click **Apply** and **OK** to make the changes effective. Now you can use our Configuration Utility instead of Windows XP Wireless Zero Configuration Utility.

Figure 3-4 Wireless Zero Configuration: Select Disable



3.3. Getting to Know the Utility

3.3.1. Profile

The Profile can keep your favorite wireless settings among your home, office and other public hotspots. You may save multiple profiles and activate the correct one at your preference.

Figure 3-5 Utility – Profile

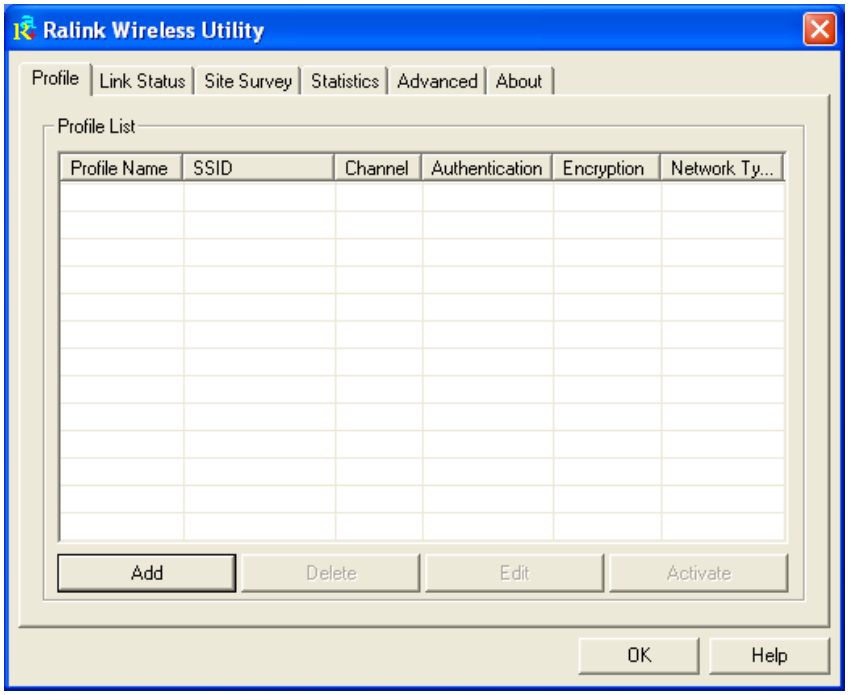


Table 3-1 Profile

LABEL	DESCRIPTION
Profile Name	Connection profile name. There is a connection icon standing for the connection status, : Indicate connection is successful on currently activated profile. : Indicate connection fails on currently activated profile.
SSID	Wireless station or ad-hoc name.
Channel	Channel in use for this wireless connection.
Authentication	The Authentication method used for this profile.
Encryption	The Encryption type used for this profile.
Network Type	The Network type used for this profile.
Add	Click **Add** to create a new profile.
Delete	Click **Delete** to delete a selected profile.
Edit	Select a profile, and click **Edit** to change an existing profile.
Activate	To activate a specific profile, select the profile, and click **Activate** button.
OK	To pop-down this utility menu.
Help	Click **Help** to display on-line help information in a pop-up screen.

3.3.1.1. Create a New Profile

Click the **Add** button on the Profile screen to create a new profile.
(A) Add Profile: Configuration
Fill the **Profile Name** and **SSID** for this new profile.
Figure 3-6 Add Profile: Configuration

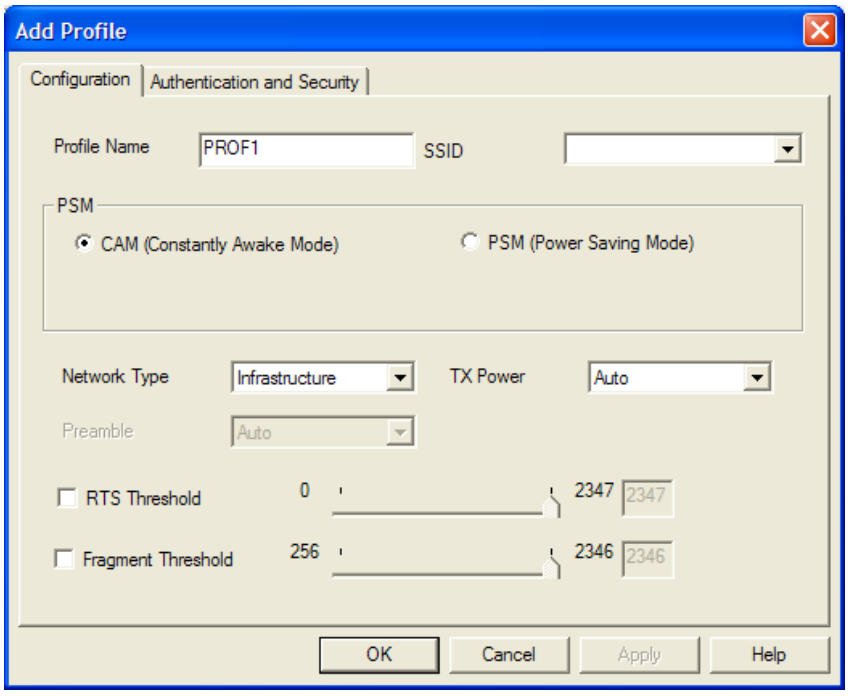


Table 3-2 Configuration

LABEL	DESCRIPTION
Profile Name	Enter the profile name that you want.
SSID	User can key in the intended SSID name or use pull down menu to select from available wireless network.
PSM	CAM (Constantly Awake Mode) – the wireless NIC will stay full power when AC power cord is plugged into power outlet. PSM (Power Saving Mode) – the wireless NIC will enter the power saving mode.
Network Type	There are two wireless modes. (A) Infrastructure - This mode allows wireless and wired networks to communicate through an access point. (B) Ad-hoc - This mode allows wireless-equipped computers to communicate directly with each other.
Preamble	There are three types: Auto, Long and Short are supported.
Ad-hoc wireless mode	There are three types: 802.11B only, 802.11B/G mixed and 802.11G only modes are supported.
TX Power	Transmit power, the amount of power used by a radio transceiver to send the signal out. User can choose power value by sliding the bar.
RTS Threshold	User can adjust the RTS threshold number by sliding the bar or key in the value directly. The default value is 2347.
Fragment Threshold	User can adjust the Fragment Threshold number by sliding the bar or key in the value directly. The default value is 2346.
Channel	Only available for setting under ad-hoc mode. User can choose the channel frequency to start their ad-hoc network.
OK	Confirms and saves the settings.
Cancel	Ignore the settings and return to the previous screen.
Help	Click **Help** to display on-line help information in a pop-up screen.

(B) Add Profile: Authentication and Security
Enter the authentication and security information here.

Figure 3-7 Add Profile: Authentication and Security: Open or Shared Key

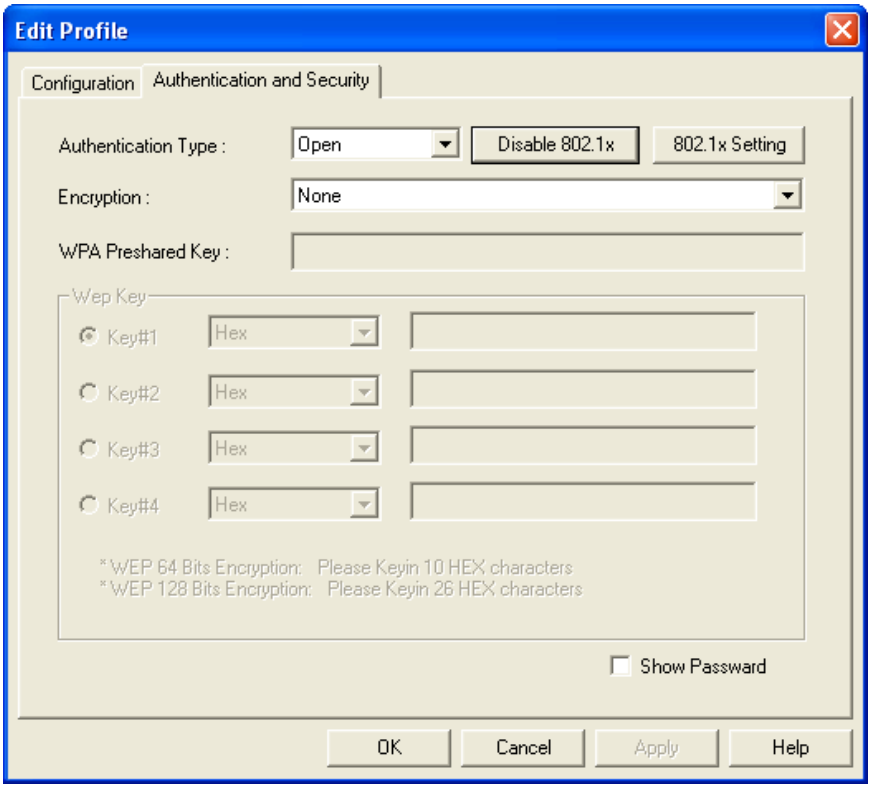


Table 3-3 Authentication: Open or Shared

LABEL	DESCRIPTION
Authentication Type	Under Open System authentication, any wireless station can request authentication. Under Shared Key authentication, each wireless station is assumed to have received a secret shared key over a secure channel that is independent from the 802.11 wireless network communications channel. To use Shared Key authentication, you must have a network key.
Encryption	Select **None** or **WEP**
WEP Key#1 .. 4	When select the **WEP** encryption or **Shared** Key authentication without 802.1x, you should enter the WEP key correctly. If the WEP key is 64-bit, please enter 10 hexadecimal or 5 ASCII characters. If the WEP key is 128-bit, please enter 26 hexadecimal or 13 ASCII characters.
Show Password	When you check this function, the password will not be covered by * symbol.
Use 802.1x	Select this option to enable IEEE 802.1x for user authentication. IEEE 802.1x can support true authentication and user control
802.1x setting	When enabling IEEE 802.1x, you should set the IEEE 802.1x parameters.

Figure 3-8 Add Profile: Authentication and Security: LEAP

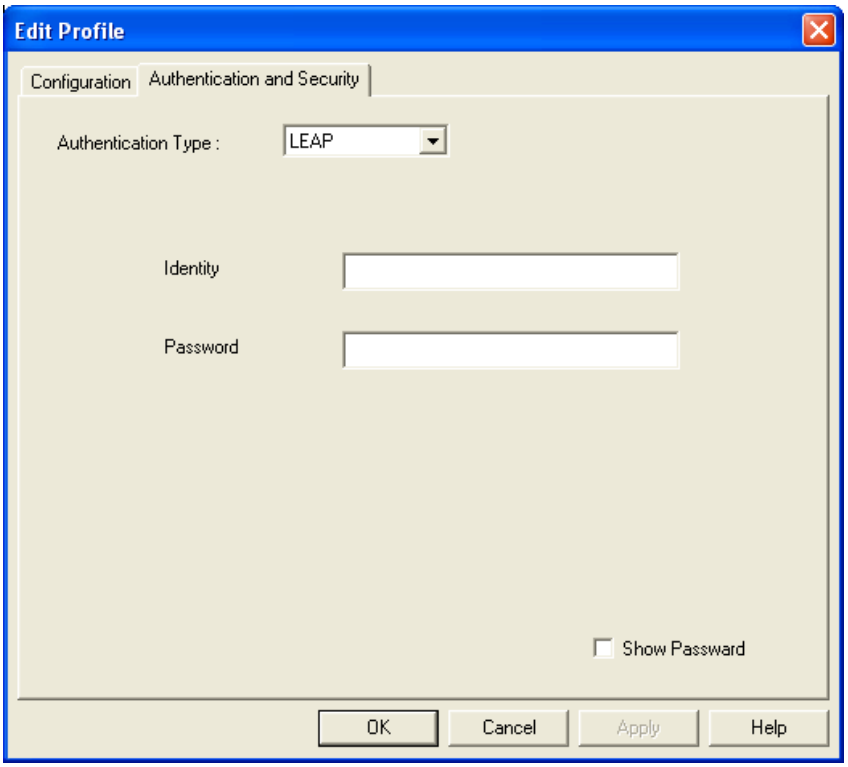


Table 3-4 Authentication: LEAP

LABEL	DESCRIPTION
Authentication Type	Light Extensible Authentication Protocol. It is an EAP authentication type used primarily in Cisco Aironet WLANs. It encrypts data transmissions using dynamically generated WEP keys, and supports mutual authentication.
Identity	Enter identity for the LEAP authentication service
Password	Enter password for the LEAP authentication service.
Show Password	When you check this function, the password will not be covered by * symbol.

Figure 3-9 Add Profile: Authentication and Security: WPA/ WPA-PSK/ WPA2/ WPA-PSK

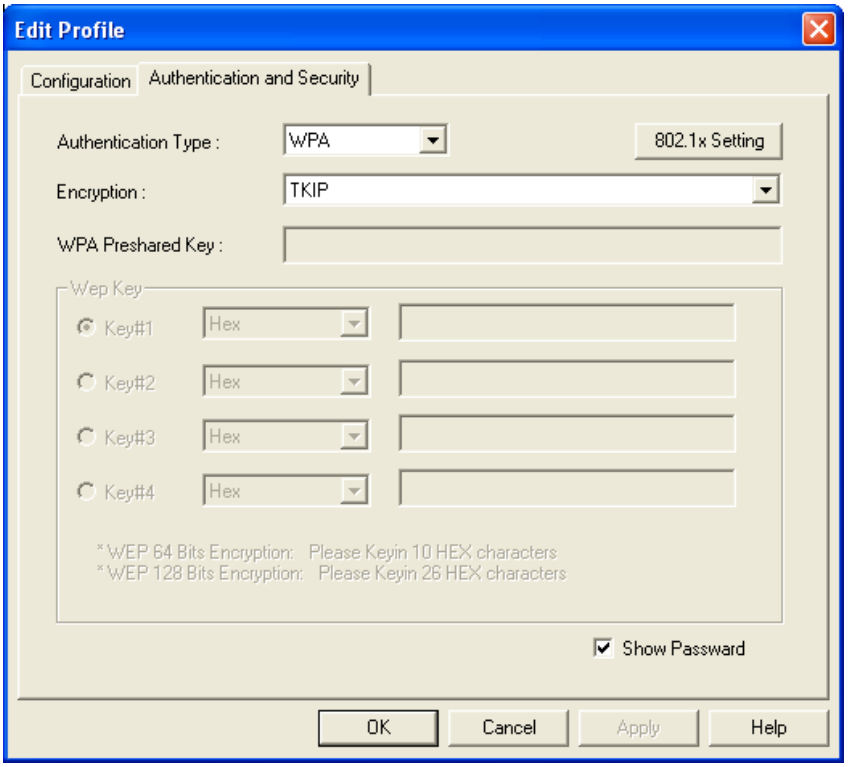


Table 3-5 Authentication: WPA/ WPA-PSK/ WPA2/ WPA-PSK

LABEL	DESCRIPTION
Authentication Type	Select **WPA**, **WPA-PSK**, **WPA2** or **WPA-PSK**
Encryption	Specify an encryption method to use. Select **TKIP** (Temporal Key Integrity Protocol) that uses a stronger encryption algorithm and protects against hackers with MIC (Message Integrity Check). Select **AES** (Advanced Encryption System) that uses symmetric 128-bit block data encryption.
WPA-PSK	Enter WPA Preshared Key, only valid for WPA-PSK and WPA2-PSK. This key should be between 8 and 32 characters in length.
802.1x setting	Only valid for WPA and WPA2.
Show Password	When you check this function, the password will not be covered by * symbol.

(C) Add Profile: 802.1x
IEEE 802.1x supports true authentication and user control.

Figure 3-10 Add Profile: Authentication and Security: 802.1x Setting: Certification

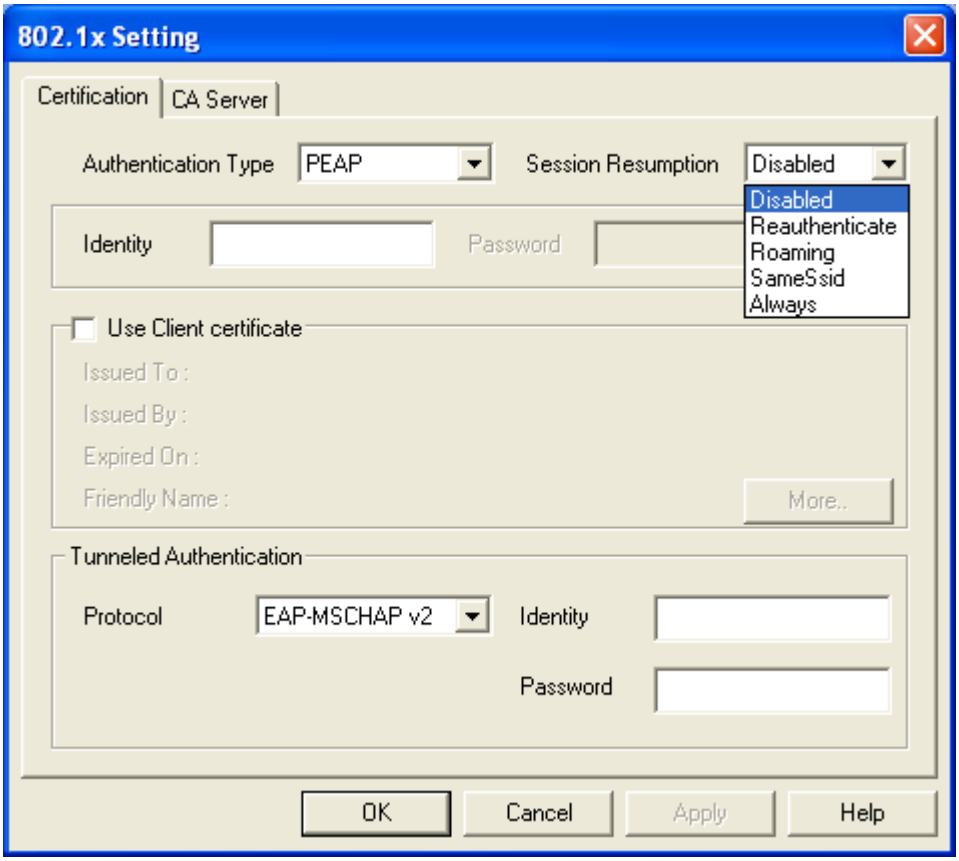


Table 3-6 Authentication: 802.1x Setting: Cerification

LABEL	DESCRIPTION
Authentication Type	**PEAP**: Protected Extensible Authentication Protocol. PEAP transports authentication data by using tunneling between PEAP clients and an authentication server. PEAP can authenticate wireless LAN clients using only server-side certificates, thus simplifying the implementation and administration of a secure wireless LAN. **TLS／Smart Card**: Transport Layer Security, provides with certificate-based and mutual authentication of the client and the network. It relies on client-side and server-side certificates to perform authentication and can be used to dynamically generate user-based and session-based WEP keys to secure subsequent communications between the WLAN client and the access point. **TTLS**: Tunneled Transport Layer Security, this security method provides for certificate-based, mutual authentication of the client and network through an encrypted channel. Unlike EAP-TLS, EAP-TTLS requires only server-side certificates. **MD5-Challenge**: Message Digest Challenge, is an EAP authentication type that provides base-level EAP support. It only supports one-way authentication i.e. there is no mutual authentication of wireless client and the network. It's only valid for profile's authentication type to be none or shared.

Table 3-6 Authentication: 802.1x Setting: Cerification

LABEL	DESCRIPTION
Session Resumption	User can choose **Disabled**, **Reauthenticate**, **Roaming**, **SameSsid** or **Always**.
Identity	Enter the Identity for server
Password	Enter the Password for server
Use Client Certificate	Enable the client certificate for server authentication.
Tunnel Authentication	
Protocol	Tunnel protocol, List information includes **EAP-MSCHAP**, **EAP-MSCHAP v2**, **CAHAP** and **MD5**.
Identity	Enter Identity for tunnel
Password	Enter Password for tunnel

If you want to use CA server, please click **CA Server** page. Depending on the EAP in use, only the server or both the server and client may be authenticated and require a certificate. Server certificates identify a server, usually an authentication or RADIUS server to clients. Most EAPs require a certificate issued by a root authority or a trusted commercial CA.

Figure 3-11 Add Profile: Authentication and Security: 802.1x Setting: CA Server

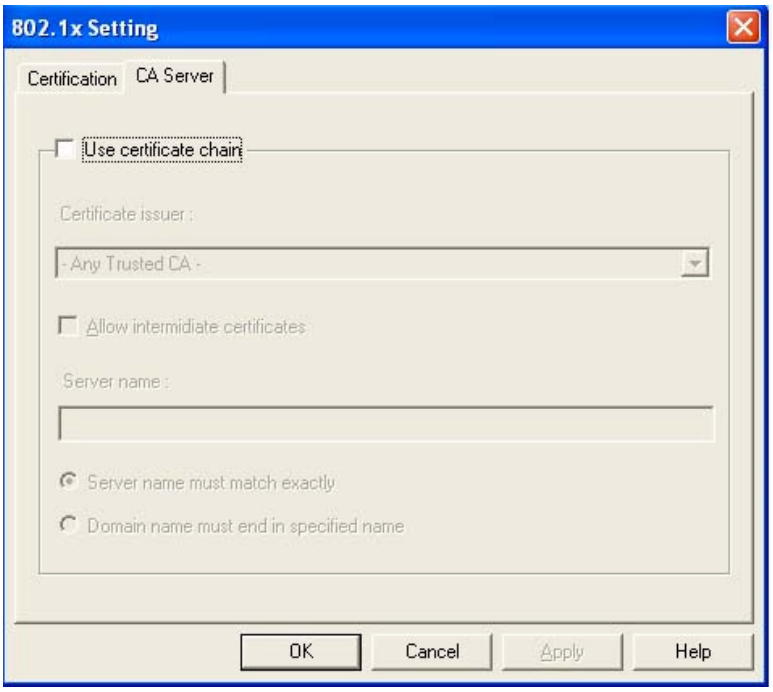


Table 3-7 Authentication: 802.1x Setting: CA Server

LABEL	DESCRIPTION
Use certificate chain	Enable the certificate feature
Certificate issuer	Choose to use server that is the issuer of certificates.
Allow intermidiate certificates	It must be in the server certificate chain between the server certificate and the server specified in the certificate issuer field.
Server name	Enter the authentication server's name. There are two matching methods, - Server name must match exactly. - Domain name must end in specified name.

3.3.2. Link Status

The Link Status provides the link information of the Wireless-G PCI Adapter.

Figure 3-12 Utility - Link Status

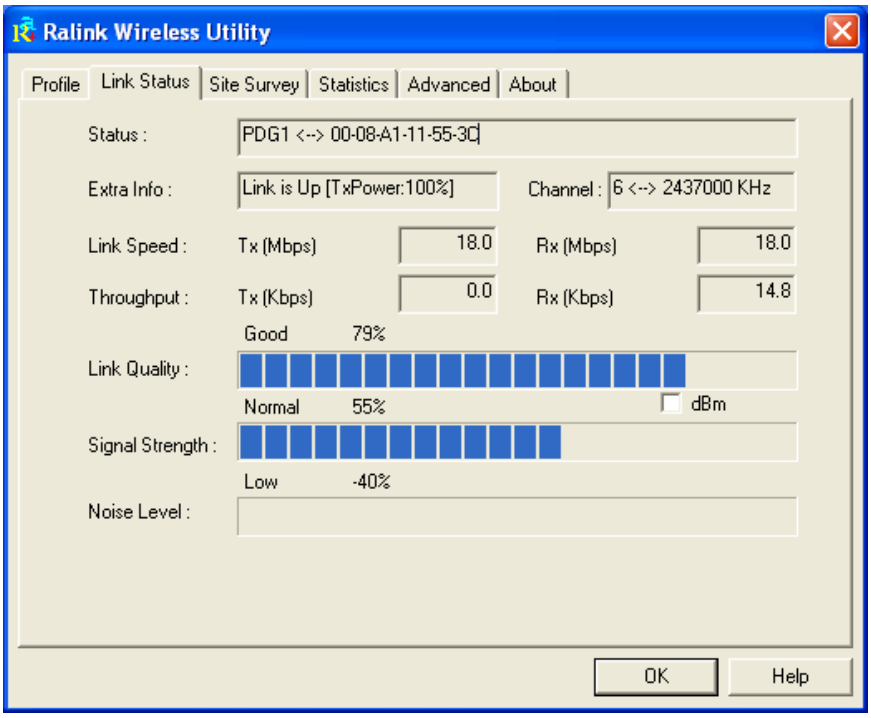


Table 3-8 Link Status

LABEL	DESCRIPTION
Status	Displays current connection status. If no connection, it will show Disconnected. Otherwise, the SSID and BSSID will show here.
Extra Info	Displays link status and current channel in use.
Channel	Shows the channel which the wireless network devices are currently using.
Link Speed	Tx(Mbps) field shows the transfer rate in megabits per second. Rx(Mbps) field shows the receive rate in megabits per second.
Throughput	Shows the amount of data moved successfully form one place to another in a given time period.
Link Quality	The level of Link Quality is displayed here by a bar indicating percentage, between 0 and 100 percent.
Signal Strength	The level of Signal Strength is displayed here by a bar indicating percentage, between 0 and 100 percent.
Noise Level	The Noise Level is displayed here by a bar indicating percentage, between 0 and 100 percent.

3.3.3. Site Survey

The site survey page displays a list of all Infrastructure and Ad-hoc wireless networks available for connection.

Figure 3-13 Utility – Site Survey

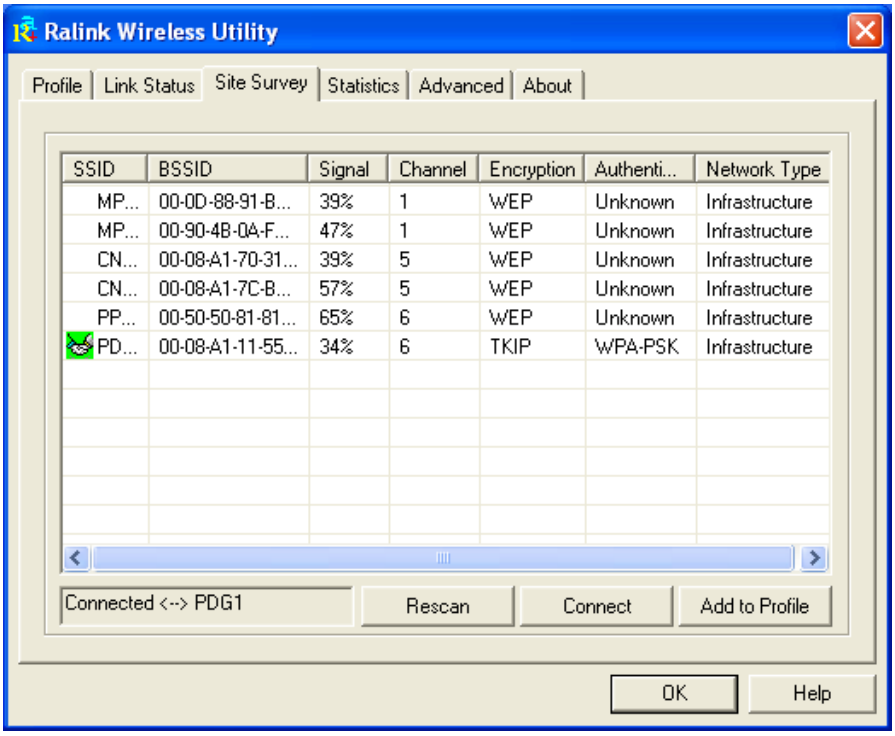


Table 3-9 Site Survey

LABEL	DESCRIPTION
SSID	Service Set ID of the Wireless Network.
BSSID	Basic Service Set ID of the Wireless Network.
Signal	Signal Strength status.
Channel	The channel used by Wireless Network.
Encryption	Encryption type.
Authentication	Authentication type used.
Network Type	Wireless Network mode. (Infrastructure mode or Ad-hoc mode)
Rescan	Click **Rescan** to re-search for wireless networks.
Connect	Select one of the networks on the list, and click the **Connect** button. Please note that if the wireless network has encryption enabled, you can't connect. If you want to connect, you must add a profile in the Profile Tab. **Note**: There is no **Connect** button in Window Vista. You have to use the **Add Profile** feature to build the wireless connection with the selected network. Please refer to the **Profile** information.
Add Profile	Add the selected network to **Profile List**.

3.3.4. Statistics

The Statistics screen provides information about the Transmit and Receive Statistics. You can reset counters if you need, otherwise click **OK**.

Figure 3-14 Utility – Statistics

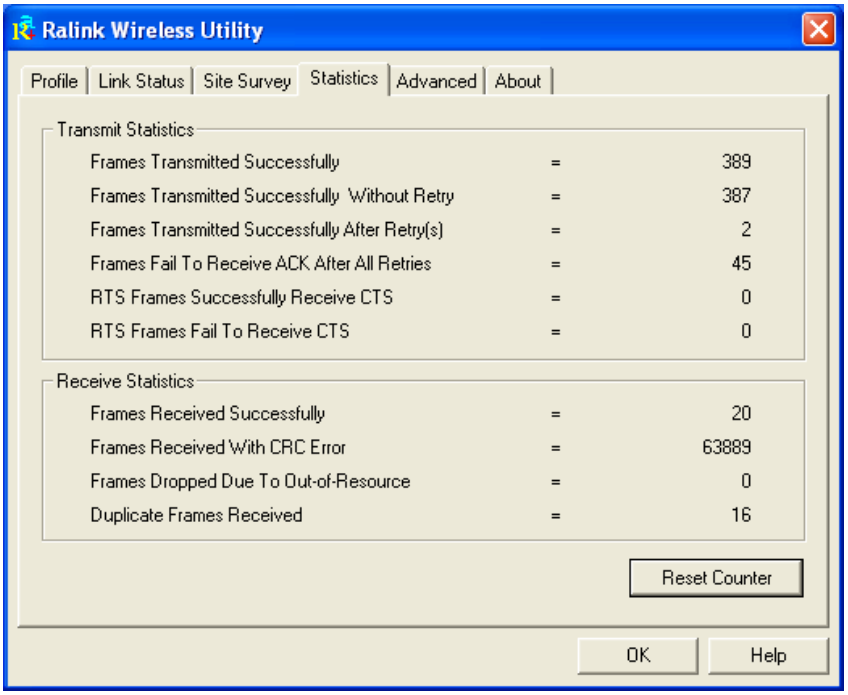

Ralink Wireless Utility
Profile
Link Status
Site Survey
Statistics
Advanced
About
Transmit Statistics
Frames Transmitted Successfully = 389
Frames Transmitted Successfully Without Retry = 387
Frames Transmitted Successfully After Retry(s) = 2
Frames Fail To Receive ACK After All Retries = 45
RTS Frames Successfully Receive CTS = 0
RTS Frames Fail To Receive CTS = 0
Receive Statistics
Frames Received Successfully = 20
Frames Received With CRC Error = 63889
Frames Dropped Due To Out-of-Resource = 0
Duplicate Frames Received = 16
Reset Counter
OK
Help

Table 3-10 Statistics

LABEL	DESCRIPTION
Transmit Statistics	Displays current transmit frame information
Receive Statistics	Displays current receive frame information.
Reset Counter	Resets all counter to zero.

3.3.5. Advanced

The Advanced screen shows settings for **Wireless Mode**, **Ad-hoc wireless mode**, **TX BURST**, **B/G Protection**, **Tx Rate** and **RF On/Off**.

Figure 3-15 Utility – Advanced

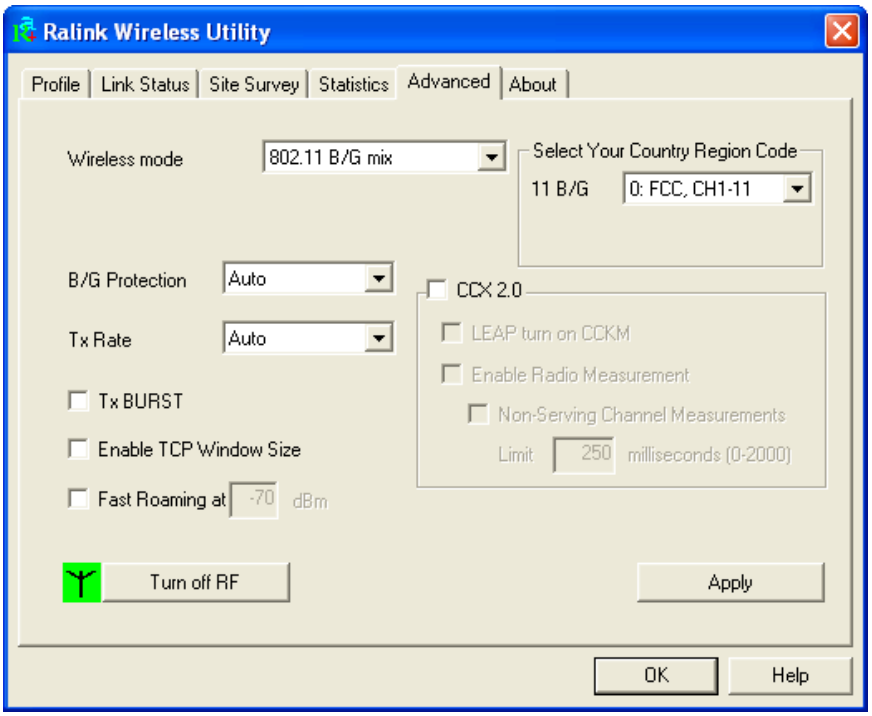


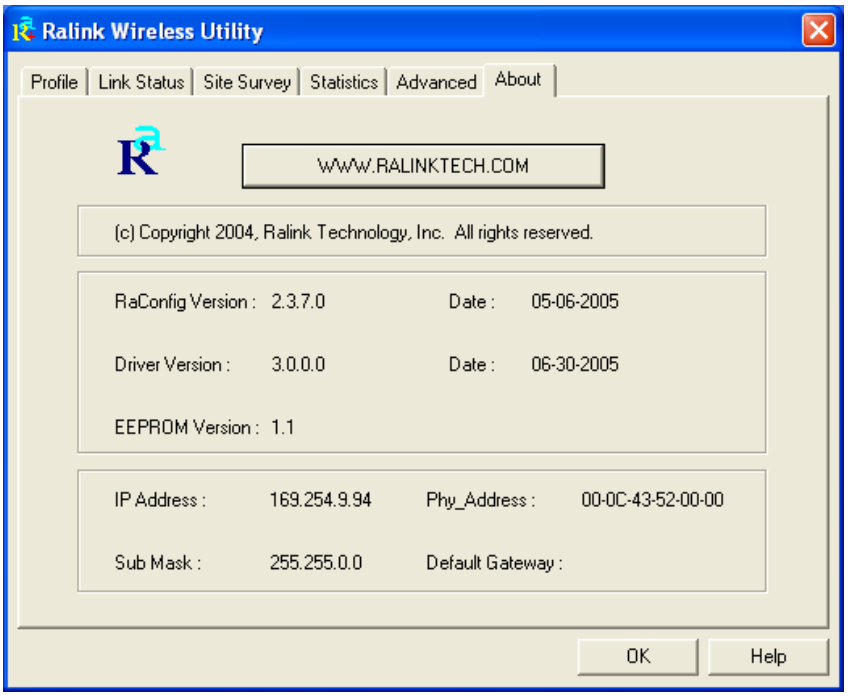
Table 3-11 Advanced

LABEL	DESCRIPTION
Wireless mode	802.11 B only: allows to connect to the 802.11b wireless stations only. 802.11 B/G mix: allows to connect to the 802.11b or 802.11g wireless stations.
Ad-hoc wireless mode	When the network type is in Ad Hoc mode that the card can only work in 802.11b data rate. It is defined by **Wi-Fi** organization. If you want to enable the data rate up to 54Mbps, please select **Ad-hoc** wireless mode.
B/G Protection	If there are 802.11b and 802.11g wireless stations in the network, it is recommended to enable the **B/G Protection** mechanism. **Auto**: Based on the status of the network and automatically disable/enable protection mode. **On**: Always send frame with protection. **Off**: Always send frame without protection.
Tx Rate	Manually selected the transmit rate. Default is **auto**.
Tx Burst	A proprietary frame burst mode which can improve transmission speed.
Enable TCP Window Size	Enables the **TCP Window Size** to improve the TCP performance over wireless link.
Fast Roaming	Roaming mechanism setup by transmit power. Roaming will be happened if the station power is less than the defined power.
Select Your Country Region Code	Selects the correct region code for your country.
CCX2.0	Supports Cisco Compatible Extensions functions: 1. LEAP turn on CCKM 2. Enable Radio Measurement: Channel measurement every 0~2000 milliseconds.
Turn off RF/ Turn on RF	You can turn off or turn on the RF feature.
Apply	Save the changes.

3.3.6. About

The About screen shows release dates as well as driver/utility versions and the MAC/IP address of the card.

Figure 3-16 Utility - Link About



Appendix 1. Troubleshooting

PROBLEM	CORRECTIVE ACTION
None of the LEDs turn on when I insert the WLAN card.	Make sure you have turned on your computer Make sure you have installed the correct utility and driver for your WLAN card. Restart your computer and insert the WLAN card. Make sure there is no hardware conflict. Check your computer resource information.
I cannot access the configuration utility	Make sure the WLAN card is inserted properly. Make sure you have installed the correct utility version.
I cannot connect to a wireless network	Make sure the ACT LED on the WLAN card is blinking. Make sure the wireless router is within range. Move your computer closer to the wireless router. Make sure that you have set the wireless network settings correctly. For example, the SSID and security settings. Make sure there is no radio interference (for example, cordless phones, microwave oven, etc) that may affect wireless transmission quality.

Appendix 2. Planning Your Wireless Network

A2-1 Network Topology

A wireless local area network (WLAN) is exactly like a regular local area network (LAN), except that each computer in the WLAN uses a wireless device to connect to the network. Computers in a WLAN share the same frequency channel and SSID, which is an identification name for wireless devices.

A2-2 Ad-hoc versus Infrastructure Mode

An ad-hoc wireless LAN is a group of computers, each equipped with one WLAN adapter, connected as an independent wireless LAN. Computers in a specific ad-hoc wireless LAN must all be configured to share the same radio channel.

Figure 17 Ad-hoc Mode

An integrated wireless and wired LAN is called an Infrastructure configuration. In this mode, a group of wireless nodes and an Access Point compose a Basic Service Set (BSS). Each wireless node in a BSS can talk to any computer in the wired LAN infrastructure via the Access Point.

Figure 18 Infrastructure Mode